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Detecting the Microlensing pattern in the microlensed long-duration signals.

An asymmetric rotating neutron star may emit quasi-monochromatic gravitational waves. Detecting such signals with second-generation detectors requires long observation times due to their low GW amplitudes. If the signal is also microlensed, the lens's mass temporarily magnifies the signal amplitude, aiding detection and providing a distinct microlensing pattern. We explore the prospects for detecting microlensed continuous gravitational wave signals using the point-mass lens approximation. We examine the feasible parameter space and strategies for directed microlensing searches. To identify the microlensing pattern, we employ both traditional data analysis techniques and machine learning methods using simulated data from ground-based detectors, specifically applying the semi-coherent Time Domain F-statistic method.

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